Name: Date:

Polynomial Factoring solution (version 27)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 12x + 54 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(12) \pm \sqrt{(12)^2 - 4(1)(54)}}{2(1)}$$

$$x = \frac{-(12) \pm \sqrt{144 - 216}}{2(1)}$$

$$x = \frac{-12 \pm \sqrt{-72}}{2}$$

$$x = \frac{-12 \pm \sqrt{-36 \cdot 2}}{2}$$

$$x = \frac{-12 \pm 6\sqrt{2}\,i}{2}$$

$$x = -6 \pm 3\sqrt{2}\,i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-2 - 9i$ and $6 + 4i$ in standard form ($a + bi$).**

Solution

$$(-2 - 9i) \cdot (6 + 4i)$$

$$-12 - 8i - 54i - 36i^2$$

$$-12 - 8i - 54i + 36$$

$$-12 + 36 - 8i - 54i$$

$$24 - 62i$$

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3. **Write function $f(x) = x^3 - 2x^2 - 36x + 72$ in factored form. I'll give you a hint: one factor is $(x + 6)$.**

Solution

	1	-2	-36	72
-6		-6	48	-72
	1	-8	12	0

$$f(x) = (x+6)(x^2 - 8x + 12)$$

$$f(x) = (x+6)(x-6)(x-2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+5)^2 \cdot (x+1) \cdot (x-4) \cdot (x-7)^2$$

Sketch a graph of polynomial $y = p(x)$.